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ABSTRACT

A study was conducted to examine the impact of a non-sex-biased, self-instructional module on preservice home economics teachers' attitudes toward teaching nutrition to adolescent males and females and to gain knowledge of students' nutritional needs. Sixty-two participants from three institutions in Pennsylvania offering undergraduate programs in home economics education were sent a self-instructional module on adolescent nutrition, the nutrition module pre- and posttests, and an evaluation form, all developed by the researcher. The sample for the study consisted of the 31 preservice home economics teachers who returned the instruments by the deadline. Demographic variables, attitudes, knowledge, and personal evaluation of the module were collected from the evaluation form. The data from the study indicate that preservice home economics teachers had significantly different attitudes toward teaching adolescent males and females about nutrition and toward general concepts related to the teaching of nutrition to adolescents after completing the module. Preservice home economics teachers also differed significantly in their knowledge of the nutritional needs of adolescent males and females after completing the module. Preservice home economics teachers had more positive attitudes toward teaching nutrition to adolescent males and females and toward general concepts related to the teaching of nutrition to adolescents after completing the module. (Author/KC)

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The Pennsylvania State University

The Graduate School

Division of Occupational and Vocational Studies

Preservice Home Economics Teachers' Knowledge of and Attitudes Toward Nutrition Education for Adolescent Males and Females

A Thesis in

Home Economics Education

by

Denise A. Appert

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

August 1982

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ABSTRACT

The purpose of this study was to examine the impact of a non-sex-biased self-instructional module on preservice home economics teachers' attitudes towards teaching nutrition to adolescent males and females and knowledge of their nutritional needs.

Sex equity is a stated goal of vocational education in Pennsylvania. Sex bias and sex-role stereotyping can be negative factors in the development of an individual's interests and abilities. The home economics teacher can provide students with the opportunity to develop their skills based on an individual's talents rather than based on sex.

The enrollment of males in home economics courses in Pennsylvania is still disproportionately low when compared to female enrollment. Studies indicate that the traditional female orientation of the subject matter and texts, the classroom environment, and attitude of the teacher may influence male participation.

Sixty-two participants from three institutions in Pennsylvania offering undergraduate programs in home economics education were sent the following: a self-instructional module on adolescent nutrition, the nutrition module pre- and posttests, and an evaluation form. All of these materials were developed by the researcher. The sample for the study consisted of 31 preservice home economics teachers who returned the instruments by the proposed deadline.

The instrument designed to collect data was divided into three parts: the attitude section, the knowledge section, and the evaluation form. Demographic variables and personal evaluation of the module were collected from the evaluation form. The attitude section was a Likert-type scale, comprised of 25 questions. The knowledge section of the test was composed of 25 true-false questions with a certainty scale.

The data from the study indicate that preservice home economics teachers had significantly different attitudes toward teaching adolescent males and females nutrition and toward general concepts related to the teaching of nutrition to adolescents after completing the module. Preservice home economics teachers also differed significantly in their knowledge of the nutritional needs of adolescent males and females after completing the module. There was no significant difference in their knowledge of the general nutritional needs of adolescents.

Year in school, number of nutrition courses completed, and institution currently attending were also examined. It was found that no significant difference in scores existed after completion of the module based on any of these variables.

Preservice home economics teachers had more positive attitudes toward teaching nutrition to adolescent males and females and towards general concepts related to the teaching of nutrition to adolescents after completing the researcher's nutrition module, Nutrition Education for Adolescents. The preservice teachers were also more knowledgeable

of the nutritional needs of adolescent males and females after exposure to the module. In conclusion, there is evidence that more positive attitudes and greater knowledge have been gained from the sample of preservice teachers who completed the module on adolescent nutrition.

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CHAPTER I

INTRODUCTION

The purpose of this study was to assess the impact of a self-instructional module on adolescent nutrition on preservice home economics teachers' knowledge of the nutrition needs of adolescent males and females and attitudes toward the teaching of adolescent males and females.

Limited research exists which specifically relates the sex bias of teachers to the instruction of nutrition in the home economics classroom. Sex bias is defined as behavior resulting from the assumption that one sex is superior or inferior to another (Murray, Appert, & Clark, 1981). The relationship between teachers and their students can be affected by sex-biased attitudes of the instructor. Limited knowledge of the nutritional differences between adolescent males and females may further affect instruction of nutrition in home economics courses.

In Pennsylvania, male enrollment in home economics is disproportionately low when compared to female enrollment. This trend is true in all the subject areas taught in home economics, including nutrition. One of the barriers to enrollment may be the negative perception of adolescent males toward home economics because of its traditionally female orientation. Home economics teachers using instructional strategies inappropriate for males and having limited

knowledge of the nutritional needs of males may further discourage male participation.

Home economics has the potential to increase the nutritional background of both adolescent males and adolescent females. "The home economics teacher may be the first and often the primary source of nutrition information for many people" (Henneman, Fox, & Kreutz, 1976, p. 25). Nutrition is especially important for teenagers because the poor eating habits of this group, compounded with increasing requirements for certain nutrients, disposes them to nutritional risk (Huenemann, 1971). Sanjur (1979) states that nutritional well-being is especially important for adolescents because the body is still formative, the emotional stress of maturing may affect nutrient absorption and utilization, and the good practices developed during childhood and adolescence will be carried into healthful adulthood. If the home economics teacher is instrumental in affecting the nutritional knowledge and attitudes of students during the adolescent stage, the nutritional vulnerability of the group may be reduced.

Background of the Study

Roles are defined as behavior patterns typically expected of people who share common characteristics (Murray et al., 1981). Sex-role expectations limit the choices for individuality, life-styles, and careers of both males and females (McCune & Matthews, 1976).

Title IX of the Educational Amendments Act of 1972, Prohibition of Sex Discrimination, was designed to reduce the restriction of choices based on sex. It states the following:

> Sec. 901 (a). No person in the United States shall, on the basis of sex, be excluded from participation in, be denied of, or be subject to discrimination under any educational program or activity receiving Federal financial assistance. (U.S. Department of Health, Education and Welfare, 1975, p. 1)

Title IX applies to elementary, secondary, and postsecondary institutions and prohibits sex discrimination in a number of areas, including vocational education, of which both occupational and vocational home economics are a part.

Sex equity, or the freedom from favoritism based on sex (Smith & Farris, 1980), is a stated goal of vocational education in Pennsylvania. According to the 1979-1980 Annual Program Provisions for Vocational Education in Pennsylvania, these goals include:

> Incentives for vocational educators to work toward equal representation of female/male/minority/handicapped students in vocational education, and to eliminate sex bias and sex stereotyping in vocational education programs.
>
> Increase the number of females/males enrolled in non-traditional programs . . . in programs which have previously been underrepresented. (1979, pp. 14-15)

These stated goals may or may not increase the incentive of home economics teachers to make a concerted effort to encourage males to attend their courses in home economics. Dittman's research findings concluded that

> . . . the teacher is the most influential variable in the classroom in defining possibilities for student learning. The teacher holds the power and makes decisions which determine not only the curriculum, but also the classroom learning climate. The teacher thus has the potential to reinforce society's traditional sex-role stereotypes and keep students within the prescriptive limits or to provide opportunities for students to explore new options and develop their own individual qualities and interests unhampered by preordained sex-role expectations. (Dittman, 1980, p. 39)

In light of the facts that increasing nontraditional enrollment and reducing sex bias are goals of vocational education, it is important to examine the attitudes and knowledge of preservice vocational home economics teachers toward the teaching of adolescent males and females. Nutrition as a component of the home economics curriculum was the focus of this examination. The specific objectives of this study were to assess the impact of a non-sex-biased self-instructional module on preservice home economics teachers':

(1) attitudes related to teaching nutrition to adolescent males and adolescent females.

(2) knowledge of the nutritional needs of adolescent males and adolescent females.

(3) attitudes toward general concepts related to teaching nutrition to adolescents.

(4) knowledge of general nutritional needs of adolescents.

CHAPTER II

LITERATURE REVIEW

The purpose of this study was to examine preservice home economics teachers' attitudes toward teaching nutrition to adolescent males and females, as well as their knowledge of the nutritional needs of adolescent males and females. The literature review is divided into two parts. The first category, educational issues related to adolescent nutrition, includes nutritional status of adolescents, sources of nutrition education for adolescents, and Pennsylvania's home economics enrollment of secondary school students. The second category, attitudes of teachers, includes a definition of attitude, the influence of teacher attitude on students, and the issue of sex bias in vocational education.

Educational Issues Related to Adolescent Nutrition

Adolescence is considered, chronologically, for the purposes of this study, the ages between 13 and 18. It can also be defined from a behavioral, physiological, and social perspective, according to Bass, Wakefield, and Kolasa (1979). In behavioral terms, adolescence begins when individuals feel they are ready for adult privileges previously not accorded to them and ends when society allows them the full power and social status of an adult. From a physiological point of view, this intensive growth period results in dramatic increases in

height and hormonal changes which affect every organ of the body (Hamilton & Whitney, 1979). From a psychological perspective, adolescents develop a need for independence and may develop a subculture that has a language and value system different from that of adults (Bass et al., 1979). These rapid physiological changes, combined with a host of hormonal, cognitive, and emotional changes, create a period of nutritional vulnerability during the adolescent years (Daniel, 1976).

The adolescent growth period begins at age 10 or 11 in females, peaks at 12, and is usually completed at 15. In males it begins at 12 or 13, peaks at 14, and usually ends at 19 (Hamilton & Whitney, 1979). Weight gain is considerable for both sexes, but males gain weight more rapidly and generate more muscle mass than females (Marino & King, 1980). About 15 percent of an adult's height and 48 percent of the skeletal mass are gained during and immediately after the adolescent growth spurt ("Dietary Practices in Adolescence," 1981).

The characteristics of adolescents that directly influence their nutritional requirements and vulnerability are:

(a) body mass nearly doubles during the adolescent spurt;

(b) energy and protein needs are closely related to the growth spurt, thus the amounts needed are at their peak in the life cycle (except during pregnancy and lactation); and

(c) the increased rate of tissue synthesis raises the demand for energy to carry out the process, and adolescents become highly sensitive to caloric restriction. (Wilson, Fisher, & Garcia, 1979, p. 448)

The Recommended Dietary Allowances are suggested intakes of various nutrients "designed for the maintenance of good nutrition of

practically all healthy people in the U.S.A." (McWilliams, 1979, p. 92). The RDA for adolescent males and females is shown in Table 1. "Nutritional recommendations by sex begin at age 11 in the RDA table, and this separation recognizes gender and growth as important factors influencing nutrient needs" (Wilson et al., 1979, p. 448). Because the growth spurt in males starts later and continues longer than for females, their need for the nutrients that support growth are greater for a longer period of time ("Adolescent Maturity and Nutritional Needs," 1981). For both sexes, actual energy needs vary with physical activity (Wilson et al., 1979). Increased amounts of thiamin, niacin, and riboflavin are needed for carbohydrate metabolism, iron for the maintenance of red blood cells, calcium for skeletal structure, folacin and B_{12} for increased protein synthesis, and Vitamins A, C, and E for preservation of the structural and functional properties of new cells ("Dietary Practices in Adolescence," 1981; Marino & King, 1980).

The Ten-State Nutrition Survey revealed that children under the age of 17, especially teenagers, had the highest prevalence of nutritional problems. Minerals often deficient in the diets of adolescents are calcium, iron, and zinc (Schorr, Sanjur, & Erickson, 1972; Sanjur, 1979; and Torre, 1977). Vitamins A, B_6, C, and folacin may also be low in the diets of many American teenagers (Marino & King, 1980; Sanjur, 1979; Hamilton & Whitney, 1979). Obesity is a common nutritional problem among adolescents (Wilson et al., 1979). Anemia, inflamatory bowel disease, and dental caries are also prevalent among teenagers in the United States ("Dietary Practices in Adolescence," 1981).

Table 1

Recommended Dietary Allowances for Adolescents

	Age (Years)			
	Males		Females	
	11-14	15-18	11-14	15-18
Weight, kg	45	66	46	55
Energy, kcal	2700	2800	2200	2100
Protein, gm	45	56	46	46
Vitamin A, mcg (R.E.)[a]	1000	1000	800	800
Vitamin D, mcg	10	10	10	10
Vitamin E, mg (a-T.E.)[b]	8	10	10	10
Vitamin C, mg	50	60	50	60
Thiamin, mg	1.4	1.4	1.1	1.1
Riboflavin, mg	1.6	1.7	1.3	1.3
Niacin, mg	18	18	15	14
Vitamin B_6, mg	1.8	2	1.8	2
Folacin, mcg	400	400	400	400
Vitamin B_{12}, mcg	3	3	3	3
Calcium, mg	1200	1200	1200	1200
Phosphorus, mg	1200	1200	1200	1200
Magnesium, mg	350	400	300	300
Iron, mg	18	18	18	18
Zinc, mg	15	15	15	15
Iodine, mcg	150	150	150	150

Source: Dietary practices in adolescence. Nutrition and the M.D., 1981, 7, p. 4.

[a]Retinol equivalents.

[b]Alpha-tocopherol equivalents.

The adolescents' life-style is an important factor which influences their food choices. According to Pelto (1981), life-style ". . . is the distillation of complex interactions of a large series of social, cultural, and situational inputs" (p. 54). The socio-psychological factors which may influence the dietary pattern of teenagers (Stare & McWilliams, 1981) are: desire for independence, acceptance by peer group, self-image, societal pressures, and emotional stresses.

The life-style of adolescents is reflected by their food habits. The increased mobility and independence of adolescents may precipitate some dietary deficiencies, according to Spindler (1963). Some general food habits which lead to poor nutritional habits include missing meals, high consumption of sweets and "fast" foods, unconventional meals, and the start of alcohol consumption (Truswell & Darton-Hill, 1981). "Estimates of alcohol use range 32 percent for seventh graders to figures as high as 93 percent for high school seniors" (Ducotte & Harris, 1981, p. 6). Some teenage athletes may practice water deprivation, fasting, and the use of protein supplements to improve athletic performance (Wilson et al., 1979; Stare & McWilliams, 1981). A particular problem of male adolescents may be induced sweat loss and restriction of food and fluids before boxing events to qualify for lower weight classification. Vegetarian diets have also become increasingly popular among American teenagers (Marino & King, 1980), and if not nutritionally balanced can adversely affect health.

Income, education, ethnic identity, residence, religious and health beliefs, physiological characteristics, and nutritional knowledge all influence dietary behavior according to Pelto (1981). Nutrition education, therefore, may be one important factor in improving the diets of teenagers. Home economics teachers may be a primary source of nutrition education for many people (Henneman et al., 1976). In a comparison of nutrition knowledge, attitudes, and beliefs, home economists scored higher than all other groups except nutritionists (Byrd-Bredbenner, 1980). Although the assumption may be that nutritionists are the most appropriate group to teach nutrition, the majority of nutritionists have not been trained in education (Carver, 1977). "All home economics teachers have the educational background to be nutrition education resource persons. . ." (Winand, 1981, p. 136). Results of a study by Marr, Shannon, and Spanier (1981) measuring nutrition training and attitudes about nutrition of teachers of grades 7 through 12 indicated that home economics teachers were the most capable group for teaching nutrition in the schools.

Home economics, as a source of nutrition education, may not be functioning equitably. In Pennsylvania, male enrollment is disproportionately lower than female enrollment. This trend has continued in all subject areas in useful home economics, including foods and nutrition, for the past three years (see Table 2).

One explanation for the disproportionately low male enrollment in home economics courses may be the negative perception of males toward the subject matter. Marshall (1977), in his comments on the

Table 2

Useful Home Economics Enrollment in Pennsylvania

Programs/Curriculum for 1980-81

	Pennsylvania Vocational Curriculum Enrollment by Sex and Grade														
	Grade 9			Grade 10			Grade 11			Grade 12			Total Enrollment		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
CHE[a]	1,457	10,957	12,414	1,588	10,317	11,905	3,102	12,282	15,384	5,629	15,085	20,714	12,017	48,931	60,948
	96.36	97.15	97.06	95.55	94.02	94.22	97.24	96.42	96.58	98.74	97.78	98.04	97.65	96.50	96.72
	11.74	88.26	100.00	13.34	86.66	100.00	20.16	79.84	100.00	27.17	72.83	100.00	19.72	80.28	100.00
CD	2	31	33	2	37	39	1	83	84	3	44	47	8	195	203
	.13	.27	.26	.12	.34	.31	.03	.65	.53	.05	.29	.22	.07	.38	.32
	6.06	93.94	100.00	5.13	94.87	100.00	1.19	98.81	100.00	6.38	93.62	100.00	3.94	96.06	100.00
CT	20	154	174	14	328	342	19	198	217	7	160	167	60	840	900
	1.32	1.37	1.36	.84	2.99	2.71	.60	1.55	1.36	.12	1.04	.79	.49	1.66	1.43
	11.49	88.51	100.00	4.09	95.91	100.00	8.76	91.24	100.00	4.19	95.81	100.00	6.67	93.33	100.00
FN	33	136	169	58	291	349	68	175	243	62	139	201	221	741	962
	2.18	1.21	1.32	3.49	2.65	2.76	2.13	1.37	1.53	1.09	.90	.95	1.80	1.46	1.53
	19.53	80.47	100.00	16.62	83.38	100.00	27.98	72.02	100.00	30.85	69.15	100.00	22.97	77.03	100.00
Total	1,512	11,278	12,790	1,662	10,973	12,635	3,190	12,738	15,928	5,701	15,428	21,129	12,306	50,707	63,013
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	11.82	88.18	100.00	13.15	86.85	100.00	20.03	79.97	100.00	26.98	73.02	100.00	19.53	80.47	100.00

Table 2 (Continued)

Programs/Curriculum for 1979-80

Pennsylvania Vocational Curriculum Enrollment by Sex and Grade

	Grade 9			Grade 10			Grade 11			Grade 12			Total Enrollment		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
CHE	1,278	10,711	11,989	1,629	11,118	12,747	3,042	12,306	15,348	5,897	15,203	21,100	12,069	49,613	61,682
	91.03	92.84	92.64	92.09	94.23	93.95	96.30	96.19	96.21	98.38	97.67	97.87	96.16	95.46	95.60
	10.66	89.34	100.00	12.78	87.22	100.00	19.82	80.18	100.00	27.95	72.05	100.00	19.57	80.43	100.00
CD	0	16	16	1	15	16	0	17	17	1	18	19	2	66	68
	0.00	.14	.12	.06	.13	.12	0.00	.13	.11	.02	.12	.09	.02	.13	.11
	0.00	100.00	100.00	6.25	93.75	100.00	0.00	100.00	100.00	5.26	94.74	100.00	2.94	97.06	100.00
CT	34	524	558	37	398	435	37	287	324	30	217	247	138	1,426	1,564
	2.42	4.54	4.31	2.09	3.37	3.21	1.17	2.24	2.03	.50	1.39	1.15	1.10	2.74	2.42
	6.09	93.91	100.00	8.51	91.49	100.00	11.42	88.58	100.00	12.15	87.85	100.00	8.82	91.18	100.00
FN	92	286	378	102	268	370	80	184	264	66	127	193	342	867	1,209
	6.55	2.48	2.92	5.77	2.27	2.73	2.53	1.44	1.65	1.10	.82	.90	2.72	1.67	1.87
	24.34	75.66	100.00	27.57	72.43	100.00	30.30	69.70	100.00	34.20	65.80	100.00	28.29	71.71	100.00
Total	1,404	11,537	12,941	1,769	11,799	13,568	3,159	12,794	15,953	5,994	15,565	21,559	12,551	51,972	64,523
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	10.85	89.15	100.00	13.04	86.96	100.00	19.80	80.20	100.00	27.80	72.20	100.00	19.45	80.55	100.00

Table 2 (Continued)

Programs/Curriculum for 1977-78

	Pennsylvania Vocational Curriculum Enrollment by Sex and Grade														
	Grade 9			Grade 10			Grade 11			Grade 12			Total Enrollment		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
CHE	1,340	10,881	12,221	1,622	11,439	13,063	3,790	13,763	17,553	6,719	16,641	23,360	13,700	53,123	66,825
	96.68	97.36	97.29	93.65	94.53	94.42	97.50	96.41	96.64	98.78	97.19	97.64	96.61	96.45	96.68
	10.96	89.04	100.00	12.42	87.57	100.00	21.59	78.41	100.00	28.76	71.24	100.00	20.50	79.50	100.00
CD	0	0	0	0	60	60	1	39	40	5	59	64	6	158	164
	0.00	0.00	0.00	0.00	.50	.43	.03	.27	.22	.07	.34	.27	.04	.29	.24
	0.00	0.00	0.00	0.00	100.00	100.00	2.50	97.50	100.00	7.81	92.19	100.00	3.66	96.34	100.00
CT	3	159	162	22	344	366	15	297	312	5	261	266	45	1,065	1,110
	.22	1.42	1.29	1.27	2.84	2.65	.39	2.08	1.72	.07	1.52	1.11	.32	1.93	1.61
	1.85	98.15	100.00	6.01	93.99	100.00	4.81	95.19	100.00	1.88	98.12	100.00	4.05	95.95	100.00
FN	43	136	179	88	258	346	81	177	258	73	161	234	285	733	1,018
	3.10	1.22	1.42	5.08	2.13	2.50	2.08	1.24	1.42	1.07	.94	.98	2.03	1.33	1.47
	24.02	75.98	100.00	25.43	74.57	100.00	31.40	68.60	100.00	31.20	68.80	100.00	28.00	72.00	100.00
Total	1,386	11,176	12,562	1,732	12,101	13,835	3,887	14,276	18,163	6,802	17,122	23,924	14,036	55,079	69,117
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	11.03	88.97	100.00	12.52	87.47	100.00	21.40	78.60	100.00	28.43	71.57	100.00	20.31	79.69	100.00

Table 2 (Continued)

Source: Vocational education enrollment report: Vocational education management information system. Harrisburg, Pa.: Pennsylvania Department of Education, 1977-78, 1979-80, 1980-81.

[a]The useful home economics occupations are Comp. Home Economics (CHE), Child Development (CD), Clothing/Textiles (CT), and Foods/Nutrition (FN).

future of men in home economics, asserts that the traditional view of home economics is based on female rather than androgynous orientation. Bell (1980a) reported that 30 percent of a group of adolescent males enrolled in home economics courses perceived the attitude of peers, parents, and teachers to be a problem. Thirty-nine percent of the surveyed males perceived facilities and instructional materials unsuitable for males. Weis (1979) found, upon examination of home economics texts for sex bias, that language and photographs depicted roles that were stereotypically female in many instances.

Home economics can offer adolescents the nutrition education that may be instrumental in improving their food behavior. Further investigation of the knowledge of home economics teachers and their attitude towards both adolescent males and females may be an important first step in improving enrollment and participation of both sexes.

Attitudes of Teachers

Theories of attitude and belief as significant factors in an educational setting are relevant to this study. One such theory is that of Rokeach (1968), which relates attitude to beliefs and values. According to Rokeach, every person has a system of beliefs about the physical, social, and personal world. Beliefs are formed from living in a society and vary in importance and depth for each individual. His definition of belief is:

> A belief is any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase "I believe that. . . ." The content

> of a belief may describe the object of a belief as true or false, correct or incorrect: evaluate it as good or bad, or advocate a certain course of action or a certain state of existence as desirable or undesirable. (Rokeach, 1968, p. 113)

Within a belief system is a subsystem called attitudes. Attitudes, according to Rokeach, are ". . . enduring organizations of belief around an object or situation, predisposing one to respond in some preferential manner" (1968, p. 112).

Triandis, in discussing the relationship between attitudes and behavior, maintains that attitudes:

> . . . involve what people think about, feel about, and how they would like to behave toward an attitude object. Behavior is not only determined by what people would like to do but also what they think they should do, that is, social norms; by what they have usually done, that is, habits; and the expected consequences of behavior. (1971, p. 14)

All attitudes are made up of several beliefs; however, not all beliefs are attitudes, as shown in Figure 1. An individual possesses many more beliefs than attitudes. Values, derived from beliefs and attitudes, are the means of developing, maintaining, and justifying attitudes to oneself and others (Rokeach, 1968).

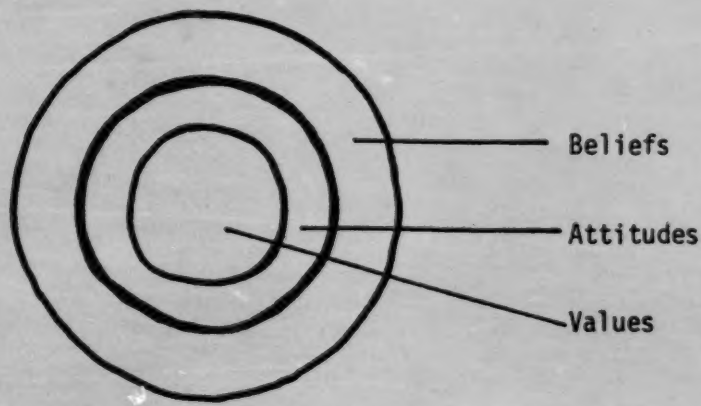

Figure 1. Composition of a Belief System.

Attitudes involve affective behavior. Affective refers to ". . . the evaluative component of attitudes associated with a feeling core of liking or disliking for social and psychological objects" (Khan & Weiss, 1973, p. 760). Teachers influence students through their affective behavior, which sets the tone of classroom environment.

> It is clear that whatever else may transpire in the school, the teacher has the most central role in the development of students' affective responses. This role stems from the teacher's interaction with instructional strategies and curriculum materials, his attitude toward the group and each child, and his educational values and beliefs. (Khan & Weiss, 1973, p. 787)

Won and Yamura (1970) contend that teachers have the greatest opportunities for exerting significance on children's lives, next to parents.

There is evidence that sex-role stereotyping is a component of the attitude of some vocational educators. Whether subtle or overt, this sex-biased behavior can hinder the development and potential of students in home economics. Identifying these attitudes and providing a means for change would be of benefit to the preservice home economics teacher.

A responsibility of vocational education is to meet the needs of both male and female students in choosing life roles and careers. Sex-role bias within the educational system can restrict students' vocational opportunities and achievements. "Stereotyped sex-role perceptions have acted as a screen preventing educators from being aware of the sources of discrimination in their own behaviors and in schools' programs, practices, and policies" (Dittman, 1980, p. 34).

Title IX of the Education Amendments of 1972 and the 1976 Amendments to the Vocational Education Act of 1963 specifically mandate that sex discrimination be eliminated from federally assisted educational programs, but despite this teachers' interactions with male and female students continue to be biased in many cases (Lewis, Kaltreider, Murray, Lewis, & Flanary, 1976). There is some evidence that some sectors of vocational education are reluctant to enter the arena of sex equity, according to Murray ("Sex Bias and Sex Role Stereotyping," 1979).

Enrollment trends indicate that there continues to be sex differentiation in vocational education. Surveys indicate that male enrollment continues to dominate in the fields of agriculture, technical, trade, and industry. These areas are traditionally accepted as male appropriate and are areas where male teachers predominate. On the other hand, home economics, office education, and health are female-dominated areas ("Sex Bias and Sex Role Stereotyping," 1979; Ott, 1978; Eversole, 1979). One reason for these trends is that male and female students are reinforced by parents, teachers, and counselors to enter fields traditional for their sex (Skrabalak, 1979). "Teachers exert overt and covert pressure upon those who depart from the traditionally accepted sex-role vocational expectation," according to Dittman (1980, p. 34).

Several studies indicate that sex inequity is continuing to be a problem in vocational education. Bell (1980b), in an analysis of problems perceived by male students in vocational homemaking education, found sex-role perceptions of home economics educators to be an

important factor affecting other variables that produce discrimination. She summarized a study by Buck which found that home economics teachers perceived that content barriers prevent males from enrolling in home economics courses. These areas include: course promotion, understanding of vocational opportunities, and lack of orientation to home economics at earlier grade levels.

Dittman (1980), in her study of sex-role perceptions of vocational educators, found that males and females were perceived in a predominately stereotyped manner by these educators. Dittman, in summarizing a related study by Cattanach, found that teachers' perceptions of students' male and female roles were more restrictive than students' perceptions of their roles.

Eversole (1979) studied the relationship between sex-role attitudes of Pennsylvania vocational educators and their stated beliefs about their own sex-role orientation. She found that vocational educators in general hold sex-stereotyped views, but women were significantly more nontraditional in their sex-role attitudes.

Trainor, Baybrook, and Kimmel (1980) conducted a study designed to assess attitudes of principles, guidance counselors, and home economics teachers toward male participation in home economics and found that changing social values and economic pressures made home economics skills essential for both sexes in the perception of these individuals.

Summary

A goal of vocational education needs to be the elimination of sex stereotypes that restrict the choices of individuals. According to Dittman (1980, p. 35), "Knowledge of educators' sex-role perception is a necessary first step to predicting and controlling inequalities in vocational education." Home economics needs to equitably meet the needs of both sexes. The knowledge of home economists and their attitudes toward adolescent males and females may determine how equitably these needs are met.

CHAPTER III

DESIGN OF THE STUDY

This study was designed to assess the impact of a non-sex-biased instructional module on nutrition education for adolescents upon the knowledge and attitudes of preservice home economics teachers.

The following null hypotheses were tested:

Hypothesis 1: There will be no significant difference between preservice home economics teachers' attitudes towards teaching nutrition to adolescent males and females before and after administration of a self-instructional module on adolescent nutrition.

Hypothesis 2: There will be no significant difference between preservice home economics teachers' knowledge of adolescent males' and females' nutritional needs before and after administration of a self-instructional module on adolescent nutrition.

Hypothesis 3: There will be no significant difference between preservice home economics teachers' attitudes toward general concepts related to the teaching of nutrition to adolescents before and after administration of a self-instructional module on adolescent nutrition.

Hypothesis 4: There will be no significant difference between preservice home economics teachers' knowledge of general nutritional needs of adolescents before and after administration of a self-instructional module on adolescent nutrition.

Selection of Sample for the Study

The sample for this study consisted of 62 preservice home economics teachers in Pennsylvania. Undergraduate students from three educational institutions who were majoring in home economics education were asked to participate in the study. These three institutions were: Indiana University of Pennsylvania, Mansfield State College, and The Pennsylvania State University. The following materials were given to or mailed to the participants, who were asked to respond anonymously:

1. A letter of introduction and an explanation of the study, asking for completion of the enclosed questionnaire (see Appendix A).
2. A three-part instrument: Nutrition Module Pretest, Nutrition Module Posttest, and Nutrition Module Evaluation Form (see Appendix B).
3. A self-instructional module on adolescent nutrition, entitled Nutrition Education for Adolescents (see Appendix C, pocket).
4. A self-addressed, prepaid envelope for completed questionnaires (for Indiana University of Pennsylvania and Mansfield State College participants).

The participants were given three weeks to complete and return the questionnaire.

Instrumentation for the Study

The information collected in this study included: scores on tests of attitude toward teaching nutrition to adolescent males and females and knowledge of the nutritional needs of adolescents before and after exposure to a self-instructional module on adolescent nutrition. This information was assessed through the nutrition module pre- and posttests. Personal data and evaluation of the module were determined from the nutrition module evaluation form.

The Nutrition Education for Adolescents Module

A 50-page self-instructional module, Nutrition Education for Adolescents, was designed by the researcher (Appendix C, pocket). Part I of the module includes information on non-sex-biased approaches to teaching nutrition, as well as information on the nutritional requirements of adolescents and the factors that influence their food choices. Instructional strategies related to a selected topic of interest to adolescents, nutrition and athletics, were included in Part II. The module was written specifically for preservice home economics teachers.

The module was reviewed by a board of reviewers consisting of four home economics teachers, a registered dietitian, an assistant professor of nutritional sciences at The Pennsylvania State University, and three faculty members of the Department of Home Economics at The Pennsylvania State University. Dr. Eloise Murray, a specialist in the area of sex equity, and Dr. Elizabeth Ray, head of the Division of Vocational Education, were included among the faculty reviewers.

The module was determined by the board to be non-sex biased and accurate in content. Permission was obtained for materials reproduced in the nutrition module. Letters of permission are included in Appendix C (pocket).

The Nutrition Module Pre- and Posttests

The Nutrition Module Pretest and the identical Nutrition Module Posttest were developed by the researcher (Appendix B). This instrument was designed to measure attitudes and knowledge of preservice home economics teachers before and after completing a self-instructional module on adolescent nutrition.

A four-response Likert-type scale was used to measure attitudes. The scale consisted of 15 items designed to measure differences in preservice home economics teachers' attitude toward teaching nutrition to adolescent males and teaching nutrition to adolescent females. The remaining 10 items in the attitude section of this instrument were non-sex-differentiated questions. These were designed to assess preservice home economics teachers' attitudes toward general concepts related to the teaching of nutrition to adolescents. The two subscales in the attitude section of this instrument are: attitudes toward teaching nutrition to adolescent males and adolescent females, and attitudes toward general nutritional concepts presented in the module. Questions marked with a single asterisk (*) belong to the first subscale. Those that are not marked with an asterisk belong to the second subscale (see Appendix B).

The second part of this instrument was designed to measure pre-service home economics teachers' knowledge of the nutritional needs of adolescent males and adolescent females before and after completion of the module. The items in this section were true-false questions containing factual information related to adolescents' nutritional needs. In answering the items as true or false, respondents were asked to indicate the certainty of their knowledge: "5" indicated the respondent was quite sure of his/her answer, "3" indicated he/she was reasonably sure, and "1" indicated the choice was his/her best guess. Fifteen of the items were designed to assess knowledge of the different nutritional needs of adolescent males and females. Ten of the items were designed to measure non-sex-differentiated knowledge of the nutritional needs of adolescents. The two subscales in the true-false section of this instrument are: knowledge of nutritional needs of adolescent males and adolescent females and knowledge of general nutrition needs of adolescents. Questions marked with a single asterisk (*) belong to the first subscale. Those that are not marked with an asterisk belong to the second subscale (see Appendix B).

A pilot test of all 50 items was administered to 15 home economics graduate students and four faculty members of the Department of Home Economics Education at The Pennsylvania State University. Revisions were made based on the evaluation of the pilot test group. A reliability was not computed because the group was only asked for their review and comment of the test. Reliability of the completed

instrument by the tested sample of preservice home economics teachers will be reported in the findings.

See Table 3 for a description of the statistical analysis used for this study.

Table 3

Statistical Analysis

	Data	Statistical Treatment
Description of Sample	Personal Data Attitude Scores Knowledge Scores	Descriptive Statistics
Analysis of Instruments	Attitude Scales Knowledge Test	Item Analysis--TESSIA
Hypothesis 1	Attitude Scores Subscale 1	*t* Test
Hypothesis 2	Knowledge Scores Subscale 1	*t* Test
Hypothesis 3	Attitude Scores Subscale 2	*t* Test
Hypothesis 4	Knowledge Scores Subscale 2	*t* Test

CHAPTER IV

FINDINGS OF THE STUDY

The purpose of this study was to assess the impact of a self-instructional module on adolescent nutrition on preservice home economics teachers' knowledge of the nutritional needs of adolescent males and females and their attitudes toward teaching adolescent males and females. The instruments used in this study were the nutrition module pre- and posttests and the nutrition module evaluation form, all developed by the researcher.

The Sample

The population for this study consisted of preservice home economics teachers in the Commonwealth of Pennsylvania. The sample was drawn from three institutions in Pennsylvania offering home economics education as an undergraduate major: Indiana University of Pennsylvania, Mansfield State College, and The Pennsylvania State University. A member of the home economics faculty at each institution was contacted by telephone prior to the study and asked to distribute the module and instruments to undergraduate home economics education majors who were interested in participating in this study. Of the 62 preservice teachers who volunteered to participate in the study, 32 (52%) returned the nutrition module pretest, posttest, and evaluation form. One of the instruments was incomplete and therefore eliminated, leaving 31 (50%) as the total sample in the study.

Demographic Data

Data on demographic variables are summarized in Table 4 for the 31 respondents. All of the respondents were female, and all were currently enrolled in a home economics education program at one of the three institutions. The two graduate students who responded were used as part of the sample because of the small sample size, although the original intention of the researcher was to survey only undergraduates. Sixty-seven percent of the sample was juniors and seniors, and the majority of the sample had completed two to three courses in nutrition prior to the study.

Description of the Instrument Data

The nutrition module pretest/posttest was developed by the researcher and consisted of 50 items (see Appendix B). The total scale was divided into two parts. Attitudes were measured in Part I, and knowledge was measured in Part II. The Test Scoring Statistics and Item Analysis (TESSIA) of The Pennsylvania State University was used to analyze the data.

Attitude Toward Teaching Nutrition to Adolescents

Part I, the attitude section of the instrument, was divided into two subscales. Fifteen items related to attitudes toward teaching nutrition to adolescent males comprised subscale 1. Ten items pertaining to general concepts in nutrition comprised subscale 2. Part I was a Likert-type scale consisting of 25 items. Respondents

Table 4

Description of Sample

Demographic Variable	Frequency	Percentage
Sex		
Male	0	0
Female	31	100
Institution		
Indiana University of Pennsylvania	15	48
Mansfield State College	7	23
The Pennsylvania State University	9	29
Year in School		
Freshman	7	23
Sophomore	0	0
Junior	11	35
Senior	10	32
Graduate Student	2	6
No Response	1	4
Number of Nutrition Courses Completed		
0	5	16
1	7	23
2	7	23
3	10	32
4	1	3
5	1	3

were asked to answer from 1 to 4 depending on their agreement with each statement.

Table 5 presents demographic data for the attitude section. Scores ranged from 65 to 98 on the attitude pretest, and 77 to 100 on the attitude posttest. The maximum score possible was 100. The average score was 80 on the pretest, with a standard deviation of 6, and 85 on the posttest, with a standard deviation of 7. The Coefficient Alpha Index of Reliability for the total attitude test was .771 on the pretest and .817 on the posttest.

The maximum score possible on subscale 1 of the attitude section, attitudes toward teaching nutrition to adolescent males and females, was 60. The mean score on the pretest (S_1) was 33, with a standard deviation of 3, and the posttest (S_1) 50, with a standard deviation of 5. The Coefficient Alpha Index of Reliability for the pretest (S_1) was .724 and for the posttest (S_1) .824. Scores ranged from 26 to 42 on the pretest and 37 to 60 on the posttest.

On subscale 2, attitudes toward general concepts in nutrition, the maximum score possible was 40. The mean score on the pretest was 34 (S_2) and the posttest 36 (S_2). The standard deviation was 4 on the pretest and 2.5 on the posttest. The Coefficient Alpha Index of Reliability was .537 on the pretest (S_2) and .317 on the posttest (S_2). Scores ranged from 27 to 34 on the pretest and from 30 to 40 on the posttest.

Table 5

Summary of Attitudes of Preservice Home Economics Teachers

Attitude Scales	Number of Items	N	Mean	Standard Deviation	Range	Standard Error of Measurement	Coefficient Alpha
Attitude Pretest	25	31	80.548	6.392	36	3.004	.771
Attitude Posttest	25	31	85.097	6.848	34	2.891	.817
Pretest (Attitude) Subscale 1	15	31	33.065	3.098	26	2.364	.724
Posttest (Attitude) Subscale 1	15	31	49.710	5.267	11	2.059	.824
Pretest (Attitude) Subscale 2	10	31	33.375	3.863	13	1.814	.537
Posttest (Attitude) Subscale 2	10	31	35.475	2.472	24	1.979	.317

Knowledge of Nutritional Needs of Adolescents

Part II, the knowledge section of the nutrition module pretest/posttest, was divided into two subscales. Fifteen items related to knowledge of the nutritional needs of adolescent males and females comprised subscale 1. Ten items pertaining to general knowledge of the nutritional needs of adolescents comprised subscale 2. Part II consisted of 25 true-false questions. Respondents were asked to identify their degree of certainty for each item on a scale of 1 to 5.

Table 6 presents descriptive data for Part II, the knowledge section. Scores ranged from 90 to 125 on the total pretest, and from 91 to 135 on the total posttest. The maximum score possible was 150 on the total knowledge section. The mean score on the pretest was 110, with a standard deviation of 9, and on the posttest 114, with a standard deviation of 10. The Coefficient Alpha Index of Reliability was .488 on the pretest and .373 on the posttest.

The maximum score possible on subscale 1 of the knowledge section, knowledge of the nutritional needs of adolescent males and females, was 90. The average score on the pretest (S_1) was 62 and the posttest (S_1) was 65. The standard deviation was 6 on the pretest and 7 on the posttest. Scores ranged from 48 to 70 on the pretest and from 53 to 80 on the posttest. The Coefficient Alpha Index of Reliability was .290 on the pretest and .111 on the posttest.

The maximum score possible on subscale 2, general knowledge of the general nutritional needs of adolescents, was 60. The mean score on the pretest was 48, with a standard deviation of 4, and on the

Table 6

Summary of Knowledge of Preservice Home Economics Teachers

Knowledge Scales	Number of Items	N	Mean	Standard Deviation	Range	Standard Error of Measurement	Coefficient Alpha
Knowledge Pretest	25	31	109.719	8.833	36	6.319	.488
Knowledge Posttest	25	31	114.355	10.079	45	7.980	.373
Pretest (Knowledge) Subscale 1	15	31	61.656	6.238	29	5.258	.290
Posttest (Knowledge) Subscale 1	15	31	65.097	6.827	28	6.437	.111
Pretest (Knowledge) Subscale 2	10	31	48.098	4.568	20	3.491	.416
Posttest (Knowledge) Subscale 2	10	31	49.258	5.400	23	4.772	.219

posttest 49, with a standard deviation of 5. Scores ranged from 39 to 58 on the pretest (S_2) and from 38 to 60 on the posttest (S_2). The Coefficient Alpha Index of Reliability was .416 on the pretest and .219 on the posttest.

Testing of Hypotheses

The hypotheses for this study dealt with the investigation of preservice home economics teachers' attitudes toward teaching nutrition to adolescents and their knowledge of the nutritional needs of adolescents. *t* tests were conducted to determine the relationship between variables.

Hypothesis 1

> There will be no significant difference between preservice home economics teachers' attitudes toward teaching nutrition to adolescent males and females before and after administration of a self-instructional module on adolescent nutrition.

Examination of the results of a *t* test in Table 7 revealed that preservice home economics teachers scored significantly higher on the nutrition module posttest than on the nutrition module pretest. The mean score on the pretest was 33; the posttest score was 50. This implies that preservice home economics teachers had more positive attitudes about teaching nutrition to males and teaching nutrition to females after exposure to the module on adolescent nutrition. Significant differences ($p = .01$) in the attitude scores were found

Table 7

Comparison of Respondents' Attitudes Toward Teaching Nutrition to Adolescent Males and Females

	N	Mean	Standard Deviation	t	p
Pretest (Attitude) Subscale 1	31	33.065	3.098		
				21.74	.01
Posttest (Attitude) Subscale 1	31	49.710	5.267		

to exist after the subjects completed the nutrition module; therefore, hypothesis 1 was rejected.

Hypothesis 2

> There will be no significant differences between preservice home economics teachers' knowledge of adolescent males' and females' nutritional needs before and after administration of a self-instructional module on adolescent nutrition.

The analysis of data as reported in Table 8 indicates that the mean score on the pretest was approximately 62 and 65 on the posttest. The *t*-test results indicate that preservice home economics teachers scored significantly higher on the posttest than the pretest, after exposure to the nutrition module. Significant differences ($p = .014$) in preservice home economics teachers' knowledge of the nutritional needs of adolescent males and nutritional needs of adolescent females meant hypothesis 2 was rejected.

Hypothesis 3

> There will be no significant difference between preservice home economics teachers' attitudes toward general concepts related to the teaching of nutrition to adolescents before and after administration of a self-instructional module on adolescent nutrition.

Table 8

Comparison of Respondents' Knowledge of the Nutritional Needs of Adolescent Males and Females

	N	Mean	Standard Deviation	t	p
Pretest (Knowledge) Subscale 1	31	61.656	6.238		
				2.60	.014
Posttest (Knowledge) Subscale 1	31	65.097	6.827		

According to results summarized in Table 9, the mean score for the pretest was 33, and for the posttest, 36. The t value was 21.64 which meant home economics teachers scored significantly higher on the posttest than on the pretest. This implies that preservice home economics teachers had more positive attitudes toward general concepts related to the teaching of nutrition to adolescents after exposure to the nutrition module. Significant differences ($p = .01$) in the attitude section of the pretest/posttest which dealt with general concepts related to teaching nutrition meant that hypothesis 3 was rejected.

Hypothesis 4

> There will be no significant differences between preservice home economics teachers' knowledge of the general nutritional needs of adolescents before and after administration of a self-instructional module on adolescent nutrition.

The data related to hypothesis 4 are presented in Table 10. There was very little difference in the mean scores of preservice home economics teachers' knowledge of the general nutritional needs of adolescents: pretest score of 48 as compared to posttest score of 49. The t-test value was 1.24 ($p = .224$); therefore, there were no significant differences in preservice home economics teachers' knowledge of the general nutritional needs of adolescents after administration of the nutrition module. Therefore, hypothesis 4 was retained.

Table 9

Comparison of Respondents' Attitudes Toward General Concepts Related to Teaching Nutrition to Adolescents

	N	Mean	Standard Deviation	t	p
Pretest (Attitude) Subscale 2	31	33.375	3.863		
				21.64	.01
Posttest (Attitude) Subscale 2	31	35.475	2.472		

Table 10

Comparison of Respondents' Knowledge of the General Nutritional Needs of Adolescents

	N	Mean	Standard Deviation	t	p
Pretest (Knowledge) Subscale 2	31	48.098	4.568		
				1.24	.224
Posttest (Knowledge) Subscale 2	31	49.258	5.400		

Additional Findings

Preservice home economics teachers were divided into subsets to determine if differences in scores existed between groups. The three subsets analyzed were: number of nutrition courses completed, year in school, and institution currently attending. A one-way analysis of variance was used. The responses of the preservice home economics teachers on the Nutrition Module Evaluation Form were also examined.

Number of Nutrition Courses Completed

The results of a one-way analysis of variance on the nutrition module pre- and posttests are presented in Table 11. The majority of the preservice teachers had completed one to three courses in nutrition at the time of the study. Small differences existed in the mean scores on the attitude pre- and posttests and the knowledge pre- and posttests. The F ratios were the following: attitude pretest, 1.479 (p = .2320); attitude posttest, .907 (p = .4921); knowledge pretest, .533 (p = .7493); and knowledge posttest, 1.057 (p = .4071). The analysis of variance indicated that no significant differences existed between groups.

Year in School

The intention of the researcher was to include only undergraduate preservice home economics students in the study, but because of the small sample size, the two graduate students were included. Students in the study fell into four categories: freshmen, juniors,

Table 11

One-Way Analysis of Variance--Number of Nutrition Courses Completed

	Number of Nutrition Courses Completed	N	Mean	F	p
Attitude Pretest	0	5	78.600		
	1	7	76.143		
	2	7	83.571	1.479	.2320
	3	10	82.700		
	4-5	2	79.000		
	Total	31	80.548		
Attitude Posttest	0	5	83.800		
	1	7	82.143		
	2	7	88.714	.907	.4921
	3	10	86.200		
	4-5	2	80.500		
	Total	31	85.097		

Table 11 (Continued)

	Number of Nutrition Courses Completed	N	Mean	F	p
Knowledge Pretest	0	5	110.600		
	1	7	106.571		
	2	7	107.286	.533	.7493
	3	10	112.800		
	4-5	2	115.500		
	Total	31	109.710		
Knowledge Posttest	0	5	108.000		
	1	7	110.571		
	2	7	118.857	1.057	.4071
	3	10	116.100		
	4-5	2	119.000		
	Total	31	114.355		

seniors, and graduate students. There were no sophomores involved in the study. Comparison of test scores based on year in school are presented in Table 12. The F ratios were the following: attitude pretest, 2.651 (p = .0698); attitude posttest, 1.978 (p = .1420); knowledge pretest, 2.429 (p = .0880); and knowledge posttest, 2.324 (p = .0983). The analysis of variance indicated that there was no significant difference between groups based on year in school.

Institution Currently Attending

The results of a one-way analysis of variance on the nutrition module pretest and posttest for institution currently attending are presented in Table 13. The mean scores from Indiana University of Pennsylvania, Mansfield State College, and The Pennsylvania State University indicate slightly higher scores for The Pennsylvania State University group when compared to either Mansfield or Indiana. The F ratios were the following: attitude pretest, 5.758 (p = .0080); attitude posttest, 2.119 (p = .1319); knowledge pretest, 4.405 (p = .0217); and knowledge posttest, 3.219 (p = .0552). The analysis of variance indicated that there was no significant difference between groups based on institution currently attending.

Nutrition Module Evaluation Form

The Nutrition Module Evaluation Form (Appendix B) was divided into five questions: (1) Background information; (2) How has this module affected your perception of your role as a nutrition educator;

Table 12

One-Way Analysis of Variance--Year in School

	Year in School	N	Mean	F	p
Attitude Pretest	Freshman	7	76.000		
	Junior	11	82.011		
	Senior	10	83.100	2.651	.0698
	Graduate Student	2	75.500		
	No Response	1	--		
	Total	31	80.567		
Attitude Posttest	Freshman	7	82.143		
	Junior	11	86.000		
	Senior	10	88.200	1.978	.1420
	Graduate Student	2	78.500		
	No Response	1	--		
	Total	31	85.333		
Knowledge Pretest	Freshman	7	103.143		
	Junior	11	112.818		
	Senior	10	110.900	2.429	.0880
	Graduate Student	2	103.000		
	No Response	1	--		
	Total	31	109.267		

Table 12 (Continued)

	Year in School	N	Mean	F	p
Knowledge Posttest	Freshman	7	107.143		
	Junior	11	118.636		
	Senior	10	116.500	2.324	.0983
	Graduate Student	2	110.000		
	No Response	1	--		
	Total	31	114.667		

Table 13

One-Way Analysis of Variance--Institution Currently Attending

	Institution	N	Mean	F	p
Attitude Pretest	Indiana	15	77.400		
	Mansfield	7	81.143	5.758	.0080
	Penn State	9	85.333		
	Total	31	80.548		
Attitude Posttest	Indiana	15	82.933		
	Mansfield	7	85.143	2.119	.1391
	Penn State	9	88.667		
	Total	31	85.097		
Knowledge Pretest	Indiana	15	105.333		
	Mansfield	7	112.000	4.405	.0217
	Penn State	9	115.222		
	Total	31	109.710		
Knowledge Posttest	Indiana	15	110.067		
	Mansfield	7	116.286	3.219	.0552
	Penn State	9	120.000		
	Total	31	114.355		

(3) What aspects of the module did you find most valuable to you as a future teacher of home economics; (4) How would you use this module in the home economics classroom--give examples; and (5) Do you have any suggestions concerning the module?

The background information has already been discussed in the previous section. A summary of the responses on questions (2) through (5) follows.

Affects of Module on Perception of Role as Nutrition Educator. In general, the responses related to the effects of the module on perception of role as a nutrition educator indicated that the preservice home economics teachers did feel that the module affected their perception. The responses of the 31 students fell into several similar categories. Many preservice teachers stated that they saw themselves more clearly as important sources of nutrition information for adolescents after completing the module. Another frequent response was that the module gave them a better idea what to teach, how to teach, and what students want and need to learn, and how to motivate them to learn. Several stated that they realized more fully the great impact their own attitude has on their students. The majority of respondents also mentioned the importance of nutrition for adolescents, the need for nutrition education for this age group, and the need for nutrition information for teachers working with adolescents.

Aspects of the Module That Were Most Valuable. All of the respondents found aspects of the module that were relevant to their

interests and needs as future teachers. The most valuable section for many of the preservice teachers was the activity section, Part II, Nutrition and Athletics. Specific comments concerning Part II were: the activities could directly be used in the classroom, they were directed towards the interests and educational level of students the preservice teachers intend to work with in the home economics classroom, and they could be used as a guideline for other activities. The preservice teachers also felt that Part I, Nutrition Education in the Home Economics Classroom, was useful. Specific comments about this section included: gave ideas for how to motivate students, offered valuable information on the nutritional needs of teenagers and their eating habits, dealt with specific problems of teenagers such as alcoholism, offered suggestions on how teachers can be change agents in the home economics classroom, and presented ideas for teaching nutrition information in the classroom. Several of the respondents also commented that the resource bibliography would be useful in their teaching experience.

Use of the Module in the Home Economics Classroom. Many of the students had specific ideas on how they would use the module in a home economics classroom where they were teaching. Many of the students mentioned that the first activity they would like to use is the survey which assesses student needs. Others stated specific activities they would especially want to use with their students from Part II, Nutrition and Athletics. Some stated that they would use the idea of a pre- and posttest for their home economics students.

Others said that they would use the module for individualized instruction, group discussion, or a reference.

Suggestions for the Module. Most of the respondents did not have any further suggestions for the module. Some of the comments that were stated included: shortening the magazine article presented in Part II, including more information on how to motivate students, changing some of the activities to meet the needs of pregnant or overweight teenage students, and including more specific information which related to questions asked on the Nutrition Module Pretest and Posttest.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study examined the impact of a non-sex-biased self-instructional module on nutrition education for adolescents upon the attitudes and knowledge of preservice home economics teachers. The first of four null hypotheses concerned the effect of the module, Nutrition Education for Adolescents, on preservice home economics teachers' attitudes toward teaching nutrition to adolescent males and females. The second hypothesis examined preservice home economics teachers' knowledge of the nutritional needs of adolescent males and females after exposure to the module. The third hypothesis dealt with preservice home economics teachers' attitudes toward general concepts related to teaching adolescents nutrition. The fourth hypothesis examined preservice home economics teachers' knowledge of the general nutritional needs of adolescents. Hypotheses 3 and 4 were also examined before and after exposure to the module.

A letter of explanation and the nutrition module pretest, post-test, and evaluation form were sent to 62 preservice home economics teachers at selected institutions in Pennsylvania. The three participating institutions were: Indiana University of Pennsylvania, Mansfield State College, and The Pennsylvania State University. All three institutions offered an undergraduate home economics program. Respondents were asked to respond anonymously to the instruments

and return them to the researcher within three weeks in the prepaid business-reply envelope.

The instrument itself consisted of 50 items. Part I was composed of a Likert-type scale consisting of 25 statements related to attitude. Fifteen of these statements were related to attitudes toward teaching nutrition to adolescent males and females. Ten of these statements related to attitudes toward general concepts related to the teaching of nutrition to adolescents. Part II consisted of 25 true-false questions designed to assess knowledge. Fifteen of the questions dealt with knowledge of the nutritional needs of adolescents, and 10, knowledge of general nutritional needs of adolescents.

The nutritional module was a 50-page self-instructional material developed by the researcher on nutrition education for adolescents. Part I included information and exercises related to nutrition education in the home economics classroom. Part II was a series of seven activities related to nutrition and athletics. The module was designed to be non-sex biased and was reviewed by a committee for validity.

The sample for the study consisted of 32 preservice home economics teachers. One of the respondents was eliminated from the sample because of an incomplete response. Therefore, 31 students comprised the actual sample.

Demographic variables for this group indicated that all participants were female. Sixty-seven percent were juniors and

seniors; the remainder were freshmen and graduate students. The majority of the sample had completed at least two or three courses in nutrition at the time of the study.

Scores were determined for each respondent in the analysis of data. The attitude section, Part I, and the knowledge section, Part II, were scored in the same direction; the higher the score, the more positive the attitude or the greater the knowledge of the respondent. Statistical procedures used in analyzing the data were *t* tests and one-way analysis of variance.

An item analysis was conducted to determine the reliability of the nutrition module pre- and posttests. The Coefficient Alpha Index of Reliability was .771 for the pretest and .871 on the posttest for the total attitude section. For the total knowledge section the reliability was low, .488 on the pretest and .373 on the posttest. The attitude section should therefore be considered more reliable than the knowledge section of the instrument. Revisions of the knowledge section are necessary for its use in further studies.

Hypotheses and Findings

Specifically, the hypotheses tested and the findings related to each were as follows.

Hypothesis 1

There will be no significant difference between preservice home economics teachers' attitudes toward teaching nutrition

to adolescent males and females before and after administration of a self-instructional module on adolescent nutrition.

To test this hypothesis, scores from the attitude pretest, subscale 1, and attitude posttest, subscale 1, were examined. A t value of 21.74 resulted at a level of significance of $p = .01$. The preservice teachers had significantly more positive attitudes based on a comparison of scores by this t test. Therefore, a significant difference was found in preservice home economics teachers' attitudes toward teaching nutrition to adolescent males and females after completing the module. Hypothesis 1 was rejected.

Hypothesis 2

There will be no significant difference between preservice home economics teachers' knowledge of adolescent males' and females' nutritional needs before and after administration of a self-instructional module on adolescent nutrition.

Scores on the knowledge pretest and knowledge posttest (subscale 1) were examined to test this hypothesis. A t value of 2.60 at a $p = .014$ level of significance was found. Preservice home economics teachers had significantly higher scores on the pretest and were therefore more knowledgeable of the nutritional needs of adolescent males and females after completing the module. Hypothesis 2 was rejected.

Hypothesis 3

There will be no significant difference between preservice home economics teachers' attitudes toward general concepts related to the teaching of nutrition to adolescents before and after administration of a self-instructional module on adolescent nutrition.

The attitude pretest and attitude posttest (subscale 2) were examined in regard to this hypothesis. The *t*-test value was 21.64 at a level of significance of $p = .01$. Significantly higher scores on the attitude (subscale 2) posttest indicated that preservice home economics teachers had a more positive attitude toward general concepts related to teaching nutrition to adolescents after completing the module. Hypothesis 3 was rejected.

Hypothesis 4

There will be no significant difference between preservice home economics teachers' knowledge of the general nutritional needs of adolescents before and after administration of a self-instructional module on adolescent nutrition.

The knowledge pretest and knowledge posttest (subscale 2) were examined in relation to hypothesis 4. A *t*-test value of 1.24 at $p = .224$ level of significance was found. Therefore, there was no significant difference in the knowledge of preservice home economics teachers of the general nutritional needs of adolescents after they completed the module. Hypothesis 4 was retained.

Additional Findings

The scores of the preservice home economics teachers were examined further to see if differences existed between groups based on number of nutrition courses completed, year in school, and institution currently attending. A one-way analysis of variance revealed that no significant differences existed between the scores of the preservice teachers based on number of nutrition courses completed. The scores of participants based on year in school were similar and not found to differ significantly based on a one-way analysis of variance. Institutional differences were examined for the scores. The Pennsylvania State University students scored consistently higher on the total pre- and posttests, but this difference was not significant.

The evaluation form revealed that in general the preservice home economics teachers felt that the module had made a positive difference in the way they perceived their role as nutrition educators. The activities presented in Part II, Nutrition and Athletics, were cited most often as materials likely to be used in future teaching experiences. Several teachers stated that the module helped them realize how their attitudes can affect students when they are teaching in home economics classes. All students felt the module was a valuable teaching material.

Conclusions

On the basis of the instruments used and data gathered in this study, and in terms of the hypotheses proposed, the following conclusions were drawn:

1. There is a significant difference between preservice home economics teachers' attitudes toward teaching nutrition to adolescent males and females after exposure to the module on adolescent nutrition. Preservice teachers had more positive attitudes after completing the module.
2. There is a significant difference in preservice home economics teachers' knowledge of the nutritional needs of adolescent males and females after exposure to the module. The participants were more knowledgeable after completing the module.
3. There is a significant difference between preservice home economics teachers' attitudes toward general concepts related to teaching nutrition to adolescents after completing the module. More positive attitudes were found after completing the module.
4. Preservice home economics teachers possess similar knowledge in regard to general nutritional needs of adolescents after completing the nutrition module. No significant difference exists between their knowledge of these general nutritional needs after exposure to the module.

The module referred to in each of the above cases appears in Appendix C (pocket).

Discussions and Implications

The preservice home economics teachers who participated in this study had more favorable attitudes toward teaching nutrition to adolescent males and females, were more knowledgeable about the nutritional needs of adolescent males and females, and had more positive attitudes toward general concepts involved in the teaching of nutrition to adolescents after completing the module, Nutrition Education for Adolescents.

The attitude section of the instrument was designed to assess the degree of sex bias or non-sex bias among the preservice home economics teachers. The mean score on the pretest increased significantly on the posttest on both the questions aimed specifically at attitudes towards teaching nutrition to adolescent males and adolescent females, as well as the non-sex-differentiated attitude questions.

The purpose of the knowledge section of the instrument was to determine if there was a difference in the knowledge of preservice home economics teachers of facts related to the nutritional needs of adolescent males and females after completing the module. The reliability of this section of the instrument was low; therefore, consistency could not be assured from sample to sample. A revision of some of the true-false questions and the addition of more questions may be necessary to improve reliability.

The mean scores on the knowledge section and statistical analysis indicate that some significant difference existed in the knowledge of preservice home economics teachers after completing the module. This difference was true of the subscale related to nutritional needs of adolescent males and females, but not true of the subscale dealing with general nutritional needs of adolescents.

The variables of institution currently attending, year in school, and number of nutrition courses completed were examined and not found to significantly make a difference in the scores on the pre- and posttests. A group from each institution, or an additional institution, who would be administered the pre- and posttests without exposure to the module would have controlled for other factors such as test-retest difference in scores. Also, a larger sample with more variety in terms of year in school would have also further substantiated the results.

Knowledge of the nutritional needs of both adolescent males and females is an important first step in meeting the needs of both sexes in home economics courses. The many factors that influence a teenager's eating habits relate to an adolescent's desire for independence, the pressure of peers, emotional stress, and self-image (Stare & McWilliams, 1981). Food becomes more than just something to eat when considering the factors that influence food choices and the potential nutritional well-being of teenagers.

Marshall (1977) asserts that the traditional female orientation of home economics discourages male participation. Since teenagers'

nutritional problems, such as poor eating habits and dietary deficiencies, affect both sexes, it is important that the home economics teacher be well informed of the unique nutritional needs of adolescent males and females.

The module, Nutrition Education for Adolescents, is an attempt to provide factual information related to the nutritional needs and interests of adolescents. Although reliability of the knowledge section of the nutrition module pretest/posttest was low, a revised instrument could provide a more accurate analysis of the effect of the nutrition module on preservice home economics teachers' knowledge of the nutritional needs of adolescents. A similar study involving inservice home economics teachers could further indicate the potential of the module for increasing knowledge.

Attitudes of teachers is perceived as a problem by some male students enrolled in home economics courses, according to a study by Bell (1980a). Dittman (1980) found that males and females were perceived in predominantly stereotyped manners by vocational educators.

If home economics is to equitably meet the needs of both sexes, reducing sex-stereotyped attitudes of preservice home economics teachers is important. The nutrition module is an attempt to present a non-sex-biased view of nutrition education. The results of this study indicate that attitudes of preservice home economics teachers toward teaching nutrition to adolescent males and females can become more positive after exposure to this module. The ultimate result of this more positive attitude may be less sex-role stereotyping by

these preservice teachers when they become inservice home economics teachers. Negative perceptions of the subject matter by male adolescents may be reduced over time and may be reflected in increased enrollment.

An adaptation of the study to incorporate inservice teachers may be useful in analyzing further the effects of the module on attitudes toward teaching nutrition to adolescents.

In view of the findings of this study, it would appear that preservice home economics teachers in the State of Pennsylvania have more positive attitudes toward teaching nutrition to adolescent males and females and greater knowledge of the nutritional needs of adolescent males and females after completing the module, Nutrition Education for Adolescents.

Recommendations for Further Study

1. An examination of preservice home economics teachers' attitudes and knowledge should be undertaken with a larger sample size, and a control group who would be given the instruments but not the module, and a revision of the knowledge section of the instrument to improve reliability.
2. A comparative study using samples from other institutions other than those chosen should be employed. Also, institutions in other states could be used.
3. A study of a similar nature could be completed with a sample of inservice home economics teachers before and after administration of the nutrition module.

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APPENDIX A

COVER LETTER FOR THE STUDY

EXPLANATION OF THIS STUDY

Title: NUTRITION EDUCATION FOR ADOLESCENTS

Investigator: Denise A. Appert, Graduate Student
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The Pennsylvania State University
University Park, Pennsylvania 16802
Phone: (814) 865-5441

Purpose: The purpose of this study is to obtain information concerning preservice teachers' attitudes and knowledge toward teaching nutrition to adolescents in the home economics classroom.

Procedures: (1) Complete Nutrition Module PRETEST.

(2) Read and complete the module Nutrition Education for Adolescents. Note: Please try to complete as much of the module as possible. You may still participate in the study if you do not complete every exercise or activity, but please try to at least read through the entire module.

(3) Complete the Nutrition Module POSTTEST and Evaluation.

(4) Return the PRETEST, POSTTEST, and Evaluation to the investigator by May 5, 1982. Please do not write your name on any of these forms! You may send them to the investigator using the prepaid envelope included with the module. (Penn State students may deliver them in person to 212 Rackley, Room C.)

Period of Time Required: To complete the entire module it will take approximately 2-3 hours.

Important Information: Your participation in this study is voluntary. There are no risks or discomforts involved in this study. The direct benefit to you is the learning experience. You will be able to keep the module for your own use.

You are free to deny any answer to any item on the pretest, posttest, or evaluation. All of your answers will remain completely confidential. You will never be identified in any way.

Also, you are free to withdraw from the study at any time. If you finish the pretest, post-test, and evaluation and return it to me I will assume that you volunteered of your own free will to take part in this study.

If you do not understand any part of the explanation of this study or your rights as a participant, please contact me by phone, mail, or in person.

Denise A. Appert

You may keep this as a record of your participation in this study.

APPENDIX B

NUTRITION MODULE INSTRUMENTS

NUTRITION MODULE PRETEST/POSTTEST

The following is a scale for preservice home economics teachers which measures attitudes toward teaching nutrition to adolescents. The best answer to each statement is your personal opinion. Please answer all items.

Please circle the letter or letters to the left of each item that best expresses your opinion about the statement in the item. SA means Strongly Agree; A means Agree; D means Disagree; and SD means Strongly Disagree. Please mark one choice for each item.

(SA) A D SD 1. The home economics teacher can be a primary source of nutrition information for many people.

(SA) A D SD * 2. Coeducational home economics classes are as acceptable to adolescent males as adolescent females.

SA A D (SD) * 3. Teenaged males are more concerned with body image than teenaged females.

SA A D (SD) 4. "Scare tactics" are likely to influence the long-term nutritional decisions of students.

SA A D (SD) * 5. The adolescent growth period is more important for females than males.

(SA) A D SD * 6. Teenaged males comprehend nutrition information as readily as teenaged females.

(SA) A D SD * 7. "Junk food" consumption occurs with similar frequency among adolescent males and females.

SA A D (SD) 8. The long-term effects of poor nutritional habits are of great concern to most adolescents.

(SA) A D SD 9. Nutritional health is closely linked to the self-image a teenager develops.

SA A D (SD) *10. Teenaged males are more interested in nutrition and athletics than teenaged females.

(SA) A D SD 11. Students are more likely to accept new nutritional practices if they are compatible with their life-style.

SA A D (SD) *12. Teaching nutrition to teenaged females is easier than teaching it to teenaged males.

SA A D (SD) 13. Persons who have the most frequent contact with teenagers are often reliable sources of nutrition information.

(SA) A D SD *14. Nutrition education is as appropriate for adolescent males as it is for adolescent females.

SA A D (SD) 15. The home economics teacher is not instrumental in influencing the dietary behavior of secondary school students.

SA A D (SD) *16. Teenaged females have a better background in nutrition than teenaged males.

(SA) A D SD 17. Home economics teachers can facilitate change in the nutritional behavior of their students.

(SA) A D SD *18. Interests in nutrition can be similar among adolescent males and females.

(SA) A D SD *19. Adolescent males are just as concerned about their weight as adolescent females.

SA A D (SD) *20. The eating habits of teenaged males are more easily influenced by peers than those of teenaged females.

SA A D (SD) *21. Teenaged males are more interested in nutrition and athletics than teenaged females.

SA A D (SD) *22. Nutrition education for males should be taught in separate classes from adolescent females.

(SA) A D SD 23. Course title and course description of nutrition courses can influence student enrollment.

SA A D (SD) *24. Nutrition education is more appropriate for adolescent females than adolescent males.

SA A D (SD) 25. The rapport of students with their home economics teacher has little to do with their acceptance of nutrition information.

This is a true-false test designed to assess your general knowledge of facts related to adolescent nutrition.

First, decide whether the statement is true or false and circle either T or F. Then, decide how sure you are that you have circled the right answer by circling one of the numbers as described below:

5--quite sure
3--reasonably sure
1--my best guess

In this test you get more points for being sure of your answers.

(T) F (5) 3 1 1. The adolescent growth period involves dramatic physical and hormonal changes.

(T) F (5) 3 1 * 2. Teenaged males have higher kcaloric requirements than teenaged females of the same age, weight, and height.

T (F) (5) 3 1 3. Most teenagers consume above the Recommended Dietary Allowances for calcium and iron.

(T) F (5) 3 1 * 4. Teenaged females are more likely to be concerned about being overweight than teenaged males.

(T) F (5) 3 1 5. Alcohol consumption increases the body's use of B-vitamins.

T (F) (5) 3 1 * 6. Growing adolescent males have higher vitamin A, vitamin C, and calcium requirements than pregnant adolescent females.

(T) F (5) 3 1 * 7. Female teenagers have the same iron requirements as male teenagers of the same age.

(T) F (5) 3 1 8. Calcium absorption and retention are increased during the adolescent growth spurt.

T (F) (5) 3 1 * 9. Teenaged females are more likely to be well nourished than teenaged males.

T (F) (5) 3 1 10. Teenaged athletes have higher protein requirements than nonathletes.

(T) F (5) 3 1 *11. Teenaged males are more likely to be concerned about being underweight than teenaged females.

T (F) (5) 3 1 *12. The adolescent growth spurt for females starts later and continues longer than for males.

T (F) (5) 3 1 13. The media is a consistently reliable source of nutrition information for adolescents.

(T) F (5) 3 1 14. The Recommended Dietary Allowance for calcium, phosphorus, magnesium, and iron is higher than any other time in life for teenaged males.

(T) F (5) 3 1 *15. During puberty boys tend to lose body fat, while the reverse is true for girls.

T (F) (5) 3 1 16. Fasting can aid in the athletic performance of teenagers.

T (F) (5) 3 1 *17. Adolescent females have a higher requirement for thiamin, riboflavin, and niacin than adolescent males.

T (F) (5) 3 1 *18. Teenaged males go to "fast food" establishments more frequently than teenaged females.

(T) F (5) 3 1 *19. The incidence of alcohol abuse is higher among adolescent males than adolescent females.

T (F) (5) 3 1 *20. Teenaged females are more physically active than teenaged males.

(T) F (5) 3 1 *21. Iron deficiency is a more common problem among teenaged females than teenaged males.

(T) F (5) 3 1 22. On the average about ¼ of a teenager's kcalories come from snacks.

T (F) (5) 3 1 *23. Adolescent females have higher iron requirements than adolescent males.

T (F) (5) 3 1 *24. The nutritional effects of alcohol over-consumption are more pronounced in adolescent males than females.

T (F) (5) 3 1 *25. Adolescent females perceive nutrition information as more relevant than adolescent males.

NUTRITION EDUCATION FOR ADOLESCENTS

PRESERVICE TEACHER EVALUATION FORM

Please complete this evaluation form as completely and honestly as possible. Do not put your name on the form. You may continue your answers on the back of this sheet.

1. Background Information:

   a) What institution are you attending? _____

   b) What year are you in? (Circle one)
   Freshman Sophomore Junior Senior

   c) What nutrition courses have you completed as an undergraduate? (List)

2. How has this module affected your perception of your role as a nutrition educator?

3. What aspects of this module did you find most valuable to you as a future teacher of home economics?

4. How would you use this module in the home economics classroom? Give examples.

5. Do you have any suggestions concerning the module?